

Missouri Childhood Lead Poisoning Prevention Program

Annual Report for Fiscal Year 2017

July 1, 2016 – June 30, 2017



Missouri Department of Health and Senior Services

<http://health.mo.gov/living/environment/lead/index.php>

573-751-6102 or 866-628-9891

Missouri Childhood Lead Poisoning Prevention Program (CLPPP)

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This report meets the statutory mandate for an annual report per §701.343, RSMo.

About Our Program

PROGRAM MISSION

The Missouri Department of Health and Senior Services (DHSS) Childhood Lead Poisoning Prevention Program's (CLPPP) mission is to assure the children of Missouri a safe and healthy environment through primary prevention and the identification of lead exposures that may cause illness or death.

The DHSS' CLPPP was established in 1993 and continues to assure that health care providers have current information and tools available to screen patients less than six years of age for lead and provide primary prevention education.

The CLPPP is staffed by the following positions: a Program Manager, a Senior Office Support Assistant, a Research Analyst, a Health Program Representative, two Data Entry Personnel, eight Environmental Specialists, and a Public Health Consultant Nurse. State guidelines describe appropriate follow-up of children with elevated blood lead levels (EBL) of at least 10 micrograms per deciliter (10 µg/dL). Based on the 97.5th percentile of the blood lead level distribution among children one to five years old in the United States, the current Centers for Disease Control and Prevention (CDC) reference level is set at ≥ 5 µg/dL. CLPPP has been working to identify ways to provide services based on CDC's reference level. DHSS staff currently notifies all Local Public Health Agencies (LPHAs) and health plans when a blood lead level is received regardless of the level. This ensures LPHAs and health plans are aware of all the children's blood lead level results and can discuss what actions will follow if any.

Follow-up activities and case management are generally provided for children six years and younger with an EBL ≥ 10 µg/dL. These activities help the family understand the causes and health effects of childhood lead poisoning. Environmental risk assessments are required per statute to be performed to identify potential sources of lead exposure for children with an EBL ≥ 15 µg/dL. While not required by statute, CLPPP also offers environmental risk assessments for children with an EBL ≥ 5 µg/dL. These risk assessments provide the family with information about where lead hazards exist in and around their home. A work plan is developed to reduce these hazards and the risks associated with them. By reducing or eliminating exposures to the environmental sources of lead, the child's blood lead level should decrease and repeated elevations should be prevented. A Department of Health and Senior Services produced Lead Fact Sheet and CDC's "Protect Your Family From Lead" booklet are mailed to families of children who have been identified with having a lead level of 5 µg/dL to 9.9 µg/dL to provide information on lead poisoning and prevention.

Lead poisoning prevention educational materials are developed and provided to Missouri citizens at various community venues. DHSS works with LPHAs, the medical community, other state agencies, businesses, schools, and community organizations to prevent childhood lead poisoning. The Missouri CLPPP created a mascot to promote lead poisoning prevention messages. The costume may be loaned to any organization in Missouri wanting to increase lead poisoning prevention education and blood lead testing.

The program currently uses the Missouri Health Strategic Architectures and Information Cooperative (MOHSAIC) database to collect lead-specific data from medical and lead program activities. This database is part of an electronic health records system to provide documentation of medical testing, case management, and environmental risk assessments statewide. The data is

used to provide comprehensive lead case management services and for statistical information. All child and adult lead test information is tracked in MOHSAIC.

Lead Poisoning in Missouri

Lead poisoning is one of the most common and preventable environmental health problems today. Almost a quarter million children in the United States are estimated to have an EBL level of at least a 10 µg/dL. According to Missouri blood lead testing data for July 1, 2016, through June 30, 2017, there were 537 children under the age of six identified with EBL levels of at least 10 µg/dL (0.63 percent of the 85,617 children tested that year).

The primary lead hazard to children in Missouri is deteriorated lead-based paint. Lead-based paint was banned for residential use nationwide in 1978. Any home built before 1978 may contain lead-based paint. The highest risk of lead exposure for children is found in homes built before 1950, when most paint contained a high percentage of lead. More than 21 percent of the housing stock in Missouri was built before 1950 (see page 5).

Lead mining and smelting are an important part of Missouri's history. Lead in Missouri was first discovered along the Meramec River by French explorers in the 1700s while searching for gold and silver. Missouri became the dominant lead-producing state in the nation in 1907. It has remained so ever since. Most early lead production came from the Old Lead Belt district of southeast Missouri in the Park Hills-Bonne Terre area, and in the Tri-State Zinc-Lead district in southwest Missouri around Joplin. Today, all of the state's lead production comes from the New Lead Belt, also known as the Viburnum Trend district. This district is a very narrow, 35-mile-long ore area extending southward from the small town of Viburnum, Iron County, in southeast Missouri. Mining waste products in these areas often end up on driveways, in yards, or even in children's play areas. Dust, air, and soil around mining activity have consistently shown elevated levels of lead contamination.

Lead is a shiny, silver-colored metal found naturally in the earth's crust. Lead has historically been used in a variety of ways including in paints, gasoline, batteries, bullets, keys, and some vinyl products such as mini-blinds. Fine particles of processed or recycled lead and/or lead dust become a health hazard when they are taken into the body through inhalation (breathing) and/or ingestion (swallowing).

Lead affects almost every organ and system in the body. The effects of lead are the same whether it is inhaled or ingested and can damage the brain, central nervous system, kidneys, and immune system. Lead in the human body is most harmful to young children under six years of age, and is especially detrimental to children less than three years of age because their systems are developing rapidly.

A blood test is used to determine lead levels. Lead can be measured in blood drawn from a vein or capillary (finger stick). Blood lead levels are measured and reported as micrograms of lead per deciliter of whole blood (µg/dL).

Statewide Screening Plan

Legislation passed in 2001 required DHSS to promulgate rules and regulations to establish a statewide screening plan. The rules and regulations define criteria for establishing geographic areas in the state considered to be at higher risk for lead poisoning, outline blood lead testing requirements and protocols, and define lead testing follow-up.

In developing these regulations, CLPPP applied Missouri surveillance and census data to establish criteria for Universal Testing (high risk) and Targeted Testing (non-high risk) areas in Missouri. Based upon those criteria, and as required by state statute, the following activities shall occur in these two areas.

In Universal Testing Areas:

- Any child under the age of six living in or visiting for more than 10 hours per week in the Universal Testing or high risk area will be tested annually for lead.
- Childcare facilities located in Universal Testing Areas must record a “proof of lead testing” signed by the health care provider within 30 days of the child’s enrollment. The statement must verify that a blood lead test was completed in the previous 12 months. If the parent/guardian does not provide proof or a written statement explaining why they do not want the child tested, the childcare facility is to offer the parent assistance in scheduling a blood lead test.

In Targeted Testing Areas the following activities shall occur:

- From six months to six years of age, every child will be screened annually using the Healthy Children and Youth (HCY) Lead Risk Assessment Guide to determine whether the child is at risk for lead poisoning. Responses given during the screening with the Guide may indicate the need for blood lead testing at an earlier age (six months) and/or more frequently.

*The HCY Lead Risk Assessment Guide can be viewed at:

<http://health.mo.gov/living/environment/lead/pdf/HCYLeadRiskAssessmentGuide.pdf>.

- Every child less than age six found to be at high risk will be blood tested for lead poisoning.
- All MO HealthNet eligible children shall be assessed by the HCY Lead Risk Assessment Guide and/or be blood lead tested at the ages stipulated by the Federal Program Guidelines (12 months of age, 24 months of age, or 12 to 72 months of age).

An updated Missouri Annual Childhood Lead Testing Area Requirements map is published every year and is available at: health.mo.gov/living/environment/lead/maps.php.

Reporting of Blood Lead Testing

Missouri's diseases and conditions reporting rule ([19 CSR 20-20.020](#)) requires reporting of all blood lead tests both elevated and non-elevated and clarifies demographic patient information required to be submitted with the report. All blood lead test results are required to be reported to the DHSS regardless of the age of the individual or the reported lead level. The data contributes to Missouri's local, regional, and statewide statistics on blood lead poisoning.

The following information is required:

- Date test was conducted
- Type of specimen (capillary or venous)
- Result of the test
- Name and address of the attending physician
- Name of the disease or condition diagnosed or suspected
- Date the test results were obtained
- Patient's complete name and home address with zip code
- Patient's date of birth
- Patient's sex and race

Health care providers should assure that the laboratory they are using is reporting to DHSS.

LeadCare Analyzers

LeadCare Analyzers are portable and easy-to-use instruments that give results of capillary blood lead samples within minutes. These devices allow the patient to receive a result immediately from the tester. LeadCare Analyzers are very convenient for physicians' offices and local health departments. These devices:

- Prevent the patient from possibly being referred to an entirely different location to have the test done.
- Save time that would be spent waiting on lab results.

The use of these instruments has increased for both providers and local public health agencies.

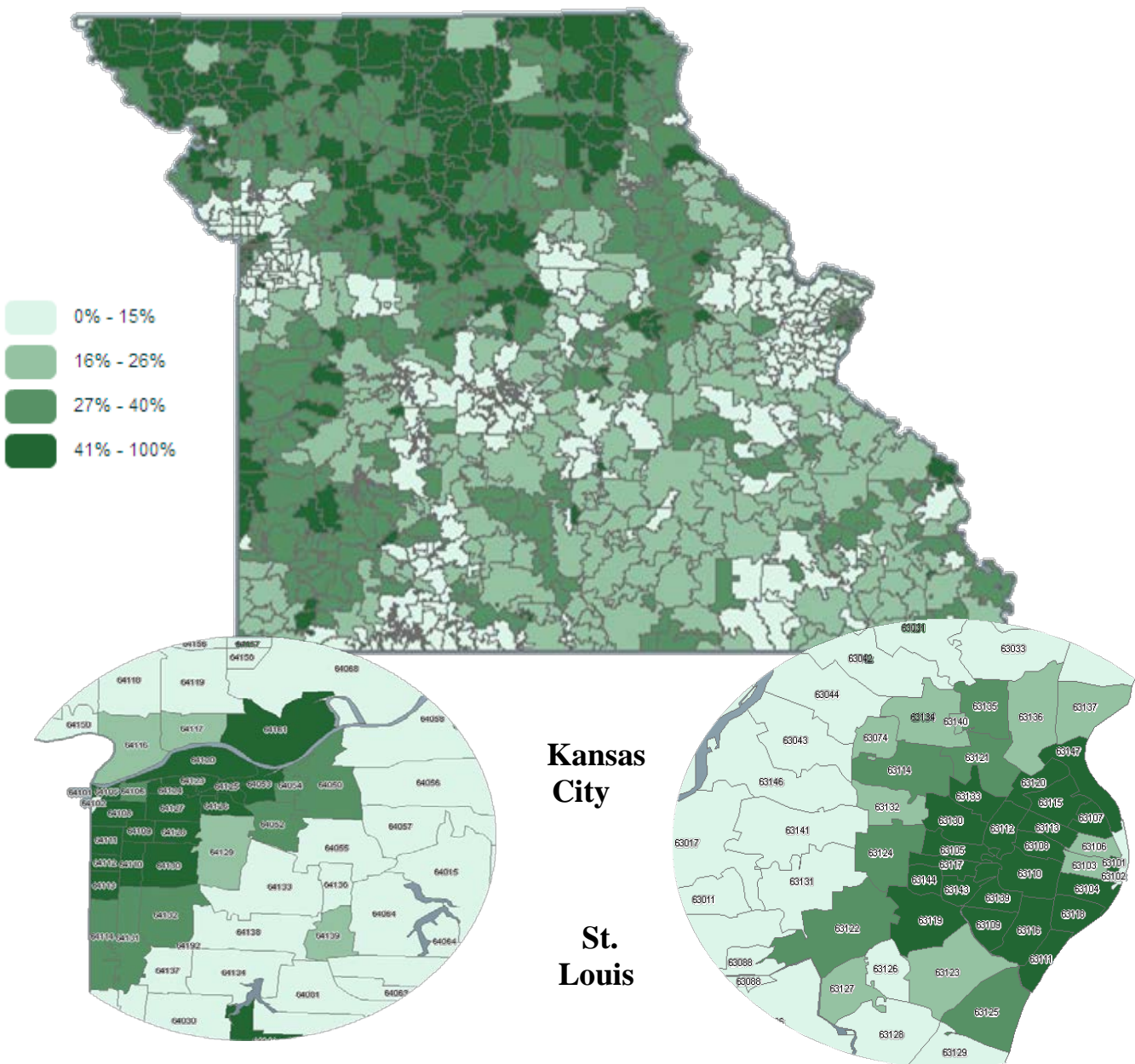
Filter Paper Blood Lead Testing

Filter Paper techniques are acceptable for blood lead testing if health care providers ensure that, as with all blood lead test methods, the chosen laboratory is participating satisfactorily in Clinical Laboratory Improvement Amendments (CLIA) certified proficiency testing (PT) program. Technical assistance is available by contacting the nurse in the DHSS Childhood Lead Poisoning Prevention Program at 573-751-6102.

Housing Risks

Nationally, the average percentage of housing built pre-1950 decreased from 22% in 2000 to 19.6 % in 2010. Missouri is above the national average with 21% of housing units built before 1950. The map below lists the percentage of pre-1950 housing by zip code according to the 2000 census data.

Percent of Missouri Pre-1950 Housing by Zip Code



Testing and Prevalence

The number of Missouri's children less than six years old who have been tested for lead poisoning has increased from 50,362 in 2000 to 85,617 in Fiscal Year 2017. Of the children tested, the percentage found to have elevated blood lead levels (10 µg/dL or greater) has declined from 11.1 percent in 2000 to 0.63 percent in 2017. This decrease mirrors a nationwide decrease in children's blood lead levels. In 2017, of the 85,617 children in Missouri who received a blood lead test, 537 had blood lead levels of 10 µg/dL or greater.

Highlights from the Fiscal Year 2017 testing data

- There were 85,617 children tested for lead during Fiscal Year 2017.
- Of children tested in Missouri, 537 (0.63 percent) had an elevated blood lead level of at least 10 µg/dL.
- The number of children found to have an EBL greater than or equal to 10 µg/dL decreased from 5,588 in 2000 to 537 in 2017.
- Approximately 21.57 percent of children tested resided in a Universal Testing Area in Fiscal Year 2017.
- 2,484 children tested had blood lead levels between 5 and 9.9 µg/dL (2.9 percent of the 85,617 children tested).

A summary of county level blood lead testing data for the period July 1, 2016, through June 30, 2017, is presented on the following pages.

Blood Lead Testing Data by County
For the period July 1, 2016, through June 30, 2017, for Children Less Than Six Years of Age

Jurisdiction	Blood Lead Level Test Results (ug/dL)											Total Tested (Not Elevated + Elevated)	Elevated Case Rate (Total Elevated / Total Tested)	2010 Census Population of Children <72 months	Percent Tested (Total Tested / <72 Population)
	0-2.9	3-4.9	5-9.9	Total Not Elevated (<10)	10-14.9	15-19.9	20-24.9	25-44.9	45-69.9	>69.9	Total Elevated (≥10)				
ADAIR	204	25	9	238	0	0	0	0	0	0	0	238	0.00%	1715	13.88%
ANDREW	230	20	11	261	2	0	0	0	0	0	2	263	0.76%	1217	21.61%
ATCHISON	30	15	9	54	0	0	0	0	0	0	0	54	0.00%	362	14.92%
AUDRAIN	399	32	12	443	6	0	0	0	0	0	6	449	1.34%	2063	21.76%
BARRY	248	50	3	301	0	0	0	0	0	0	0	301	0.00%	2726	11.04%
BARTON	109	10	5	124	1	0	0	0	0	0	1	125	0.80%	997	12.54%
BATES	201	31	10	242	1	0	2	0	0	0	3	245	1.22%	1369	17.90%
BENTON	104	17	11	132	1	0	0	0	0	0	1	133	0.75%	1001	13.29%
BOLLINGER	165	46	6	217	0	0	0	0	0	0	0	217	0.00%	907	23.93%
BOONE	2320	101	26	2447	3	1	0	1	0	0	5	2452	0.20%	12126	20.22%
BUCHANAN	1106	212	99	1417	18	6	6	3	0	0	33	1450	2.28%	7321	19.81%
BUTLER	547	263	18	828	0	0	0	0	0	0	0	828	0.00%	3369	24.58%
CALDWELL	104	16	8	128	2	0	0	0	0	0	2	130	1.54%	722	18.01%
CALLAWAY	462	43	8	513	0	0	0	0	0	0	0	513	0.00%	3169	16.19%
CAMDEN	339	27	5	371	1	0	0	0	0	0	1	372	0.27%	2610	14.25%
CAPE GIRARDEAU	670	94	28	792	4	1	1	2	0	0	8	800	1.00%	5638	14.19%
CARROLL	145	18	7	170	3	0	1	0	0	0	4	174	2.30%	634	27.44%
CARTER	69	20	2	91	0	0	0	0	0	0	0	91	0.00%	515	17.67%
CASS	958	52	13	1023	3	0	0	0	0	0	3	1026	0.29%	8174	12.55%
CEDAR	105	23	4	132	0	0	0	0	0	0	0	132	0.00%	1002	13.17%
CHARITON	104	9	1	114	1	0	0	0	0	0	1	115	0.87%	575	20.00%
CHRISTIAN	799	148	17	964	2	1	0	0	0	0	3	967	0.31%	7017	13.78%
CLARK	73	23	11	107	2	1	1	0	0	0	4	111	3.60%	577	19.24%
CLAY	2806	133	23	2962	4	2	0	1	0	0	7	2969	0.24%	19570	15.17%
CLINTON	176	20	8	204	2	0	1	1	0	0	4	208	1.92%	1569	13.26%
COLE	738	81	21	840	1	0	0	0	0	0	1	841	0.12%	6099	13.79%
COOPER	200	13	4	217	0	0	1	0	0	0	1	218	0.46%	1291	16.89%
CRAWFORD	291	33	2	326	1	1	0	0	0	0	2	328	0.61%	2000	16.40%
DADE	76	18	7	101	0	0	0	0	0	0	0	101	0.00%	494	20.45%
DALLAS	158	31	2	191	0	0	0	0	0	0	0	191	0.00%	1368	13.96%

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	0-2.9	3-4.9	5-9.9	Total Not Elevated (<10)	10-14.9	15-19.9	20-24.9	25-44.9	45-69.9	>69.9	Total Elevated (≥10)				
DAVIESS	112	8	6	126	0	0	0	0	0	0	0	126	0.00%	757	16.64%
DEKALB	131	14	4	149	0	0	0	0	0	0	0	149	0.00%	706	21.10%
DENT	171	77	5	253	0	0	0	1	0	0	1	254	0.39%	1145	22.18%
DOUGLAS	180	38	2	220	1	0	0	0	0	0	1	221	0.45%	983	22.48%
DUNKLIN	452	47	6	505	0	1	1	0	0	0	2	507	0.39%	2640	19.20%
FRANKLIN	852	45	20	917	4	1	0	0	0	0	5	922	0.54%	7862	11.73%
GASCONADE	140	22	6	168	0	0	0	0	0	0	0	168	0.00%	1009	16.65%
GENTRY	112	11	5	128	1	0	0	0	0	0	1	129	0.78%	542	23.80%
GREENE	2592	459	61	3112	10	2	3	1	0	0	16	3128	0.51%	20451	15.30%
GRUNDY	148	25	23	196	2	3	0	0	0	0	5	201	2.49%	853	23.56%
HARRISON	95	13	11	119	2	0	0	0	0	0	2	121	1.65%	781	15.49%
HENRY	257	14	11	282	1	0	0	0	0	0	1	283	0.35%	1583	17.88%
HICKORY	88	7	5	100	0	0	0	0	0	0	0	100	0.00%	535	18.69%
HOLT	62	14	5	81	0	0	0	0	0	0	0	81	0.00%	336	24.11%
HOWARD	144	20	6	170	0	0	0	0	0	0	0	170	0.00%	732	23.22%
HOWELL	233	112	9	354	0	0	0	0	0	0	0	354	0.00%	3389	10.45%
IRON	185	89	31	305	2	0	0	0	0	0	2	307	0.65%	742	41.37%
JACKSON	9719	1885	272	11876	53	21	4	8	3	0	89	11965	0.74%	57177	20.93%
JASPER	1944	274	113	2331	7	3	1	2	1	0	14	2345	0.60%	10727	21.86%
JEFFERSON	1527	102	26	1655	2	0	0	0	0	0	2	1657	0.12%	18009	9.20%
JOHNSON	261	66	16	343	1	0	0	0	0	0	1	344	0.29%	4267	8.06%
KANSAS CITY	7620	917	249	8786	48	20	3	7	3	0	81	8867	0.91%	40849	21.71%
KNOX	50	3	0	53	0	0	0	0	0	0	0	53	0.00%	323	16.41%
LACLEDE	317	147	5	469	2	0	0	0	0	0	2	471	0.42%	3029	15.55%
LAFAYETTE	336	141	14	491	0	0	0	0	0	0	0	491	0.00%	2511	19.55%
LAWRENCE	346	70	14	430	4	0	0	0	0	0	4	434	0.92%	3220	13.48%
LEWIS	135	32	12	179	0	0	0	0	0	0	0	179	0.00%	762	23.49%
LINCOLN	522	25	5	552	0	0	0	0	0	0	0	552	0.00%	4892	11.28%
LINN	127	18	3	148	1	1	1	0	0	0	3	151	1.99%	1009	14.97%
LIVINGSTON	212	21	10	243	1	0	0	1	0	0	2	245	0.82%	1127	21.74%
MCDONALD	260	25	6	291	2	0	0	0	1	0	3	294	1.02%	2022	14.54%
MACON	204	22	12	238	0	0	0	1	0	0	1	239	0.42%	1266	18.88%
MADISON	216	57	25	298	2	0	0	0	0	0	2	300	0.67%	956	31.38%

Jurisdiction	Blood Lead Level Test Results (ug/dL)											Total Tested (Not Elevated + Elevated)	Elevated Case Rate (Total Elevated / Total Tested)	2010 Census Population of Children <72 months	Percent Tested (Total Tested / <72 Population)
	0-2.9	3-4.9	5-9.9	Total Not Elevated (<10)	10-14.9	15-19.9	20-24.9	25-44.9	45-69.9	>69.9	Total Elevated (≥10)				
MARIES	79	13	3	95	0	0	0	0	0	0	0	95	0.00%	680	13.97%
MARION	440	93	45	578	9	3	1	0	0	0	13	591	2.20%	2373	24.91%
MERCER	39	9	0	48	0	0	0	0	0	0	0	48	0.00%	314	15.29%
MILLER	234	18	4	256	1	0	0	0	0	0	1	257	0.39%	1932	13.30%
MISSISSIPPI	293	70	11	374	2	0	0	0	0	0	2	376	0.53%	1084	34.69%
MONITEAU	152	34	11	197	0	0	0	0	0	0	0	197	0.00%	1306	15.08%
MONROE	88	21	1	110	0	0	0	0	0	0	0	110	0.00%	658	16.72%
MONTGOMERY	205	49	8	262	0	0	0	0	0	0	0	262	0.00%	920	28.48%
MORGAN	126	18	7	151	0	0	0	0	0	0	0	151	0.00%	1503	10.05%
NEW MADRID	319	71	12	402	0	0	0	0	0	0	0	402	0.00%	1507	26.68%
NEWTON	828	122	46	996	7	1	0	0	0	0	8	1004	0.80%	4638	21.65%
NODAWAY	270	43	12	325	4	2	1	0	0	0	7	332	2.11%	1479	22.45%
OREGON	148	48	3	199	0	0	0	0	0	0	0	199	0.00%	736	27.04%
OSAGE	152	22	5	179	0	0	0	0	0	0	0	179	0.00%	1095	16.35%
OZARK	58	21	0	79	0	0	0	0	0	0	0	79	0.00%	601	13.14%
PEMISCOT	168	25	1	194	0	0	0	0	0	0	0	194	0.00%	1674	11.59%
PERRY	136	7	5	148	0	0	0	0	0	0	0	148	0.00%	1533	9.65%
PETTIS	493	85	58	636	5	2	1	1	0	0	9	645	1.40%	3739	17.25%
PHELPS	466	144	2	612	0	0	0	0	0	0	0	612	0.00%	3326	18.40%
PIKE	183	45	13	241	2	0	1	0	0	0	3	244	1.23%	1349	18.09%
PLATTE	922	40	5	967	1	1	1	0	0	0	3	970	0.31%	6855	14.15%
POLK	383	47	11	441	0	0	0	0	0	0	0	441	0.00%	2402	18.36%
PULASKI	262	60	6	328	0	0	1	0	0	0	1	329	0.30%	4660	7.06%
PUTNAM	41	3	1	45	0	0	0	0	0	0	0	45	0.00%	371	12.13%
RALLS	113	23	5	141	3	0	1	2	0	0	6	147	4.08%	768	19.14%
RANDOLPH	256	62	26	344	0	1	0	0	0	0	1	345	0.29%	1921	17.96%
RAY	354	35	4	393	1	0	0	0	0	0	1	394	0.25%	1735	22.71%
REYNOLDS	55	18	5	78	0	0	0	0	0	0	0	78	0.00%	476	16.39%
RIPLEY	149	26	2	177	0	0	0	0	0	0	0	177	0.00%	991	17.86%
ST CHARLES	2022	59	12	2093	1	0	0	0	0	0	1	2094	0.05%	29474	7.10%
ST CLAIR	35	5	2	42	1	0	0	0	0	0	1	43	2.33%	585	7.35%
STE GENEVIEVE	209	12	5	226	0	0	0	0	0	0	0	226	0.00%	1239	18.24%
ST FRANCOIS	629	109	46	784	3	1	0	1	0	0	5	789	0.63%	4811	16.40%

Jurisdiction	Blood Lead Level Test Results (ug/dL)											Total Tested (Not Elevated + Elevated)	Elevated Case Rate (Total Elevated / Total Tested)	2010 Census Population of Children <72 months	Percent Tested (Total Tested / <72 Population)
	0-2.9	3-4.9	5-9.9	Total Not Elevated (<10)	10-14.9	15-19.9	20-24.9	25-44.9	45-69.9	>69.9	Total Elevated (≥10)				
ST LOUIS CITY	8447	1491	607	10545	100	28	17	16	2	0	163	10708	1.52%	24645	43.45%
ST LOUIS COUNTY	13803	899	243	14945	23	10	3	5	0	0	41	14986	0.27%	70993	21.11%
SALINE	339	48	18	405	2	0	0	0	0	0	2	407	0.49%	1781	22.85%
SCHUYLER	67	13	4	84	0	0	0	0	0	0	0	84	0.00%	344	24.42%
SCOTLAND	28	3	0	31	0	0	0	0	0	0	0	31	0.00%	470	6.60%
SCOTT	682	120	15	817	0	0	0	0	0	0	0	817	0.00%	3304	24.73%
SHANNON	27	6	2	35	0	0	0	0	0	0	0	35	0.00%	638	5.49%
SHELBY	127	17	2	146	0	0	1	0	0	0	1	147	0.68%	519	28.32%
STODDARD	430	52	4	486	0	1	0	0	0	0	1	487	0.21%	2171	22.43%
STONE	163	32	7	202	0	1	0	0	0	0	1	203	0.49%	1694	11.98%
SULLIVAN	181	13	4	198	1	0	0	0	0	0	1	199	0.50%	528	37.69%
TANEY	367	20	5	392	2	0	0	0	0	0	2	394	0.51%	3754	10.50%
TEXAS	161	31	3	195	2	0	0	0	0	0	2	197	1.02%	1911	10.31%
VERNON	156	24	13	193	3	0	0	0	0	0	3	196	1.53%	1754	11.17%
WARREN	356	29	6	391	1	0	0	0	0	0	1	392	0.26%	2746	14.28%
WASHINGTON	170	33	13	216	2	0	0	0	0	0	2	218	0.92%	1967	11.08%
WAYNE	119	18	3	140	0	0	0	1	0	0	1	141	0.71%	858	16.43%
WEBSTER	316	71	11	398	1	0	0	0	0	0	1	399	0.25%	3219	12.40%
WORTH	36	3	2	41	2	0	0	0	0	0	2	43	4.65%	124	34.68%
WRIGHT	286	55	6	347	0	0	0	0	0	0	0	347	0.00%	1569	22.12%
Grand Total	72634	9962	2484	85080	335	96	51	48	7	0	537	85617	0.63%	468264	18.28%

Data Notes:

Kansas City tests are reflected in both the Kansas City row and the rows for their respective counties. The Kansas City row is not counted in the Grand Total.

Lead Poisoning Prevention Education

CLPPP develops an educational campaign and distributes materials to advocates statewide each year. The campaign goal is to provide stakeholders with the tools necessary to promote lead poisoning prevention. Themes, fact sheets, posters, and public service announcements are examples of campaign materials. The materials are used during lead poisoning prevention month to intensify the statewide effort.

Several educational brochures and fact sheets that focus on specific lead related issues such as *Pregnancy and Lead Poisoning* and *A Health Care Provider's Guide to Lead Screening and Testing Requirements* are also available and can be ordered for community-wide use.

Educational materials are also available and displayed at health fairs, home shows, blood lead testing events, and other public events when possible. Display boards provide visitors with lead poisoning prevention posters, signs, facts, and other educational materials. The display boards are helpful to capture people's attention and draw them in to learn about other healthy homes topics such as radon and mold.

Lead Poisoning Prevention Week (observed in October) campaign information, newsletters, fact sheets, booklets, and other publications are all available to the public on the CLPPP webpage. The webpage also features: upcoming events, lead testing guidelines, Missouri Annual Childhood Lead Testing Area Requirements maps, product recalls, data and statistical reports, laws, regulations, and manuals. CLPPP personnel worked with St. Joseph, St. Francois, Johnson, Audrain, and Gentry Tri-Counties testing for blood lead levels on children less than 72 months during their monthly Women, Infant, and Children (WIC) events. The team also attended a Lead Poisoning Prevention Webinar.

Collaborations

Case Management Services

Case management of children with EBL levels involves coordinating, providing, and overseeing the services required to help reduce the child's blood lead level. During fiscal year 2017, case managers strived to reduce EBL levels to less than 10 µg/dL. It is based on the efforts of an organized team and is child, physician, and family centered. Lead case management services may be provided by the child's primary care physician, LPHA, or a MO HealthNet Managed Care health plan. At times, other disciplines, such as behavioral health, are part of the case management system. In some cases, interpretive services may be indicated and these individuals will also interact with lead case managers. DHSS Childhood Lead Poisoning Prevention staff, along with MO HealthNet and LPHA staff, monitors case management for children identified with a blood lead level greater than or equal to 10 µg/dL. The MOHSAIC system is used to provide a centralized documented record of communications, results, case management interventions, and updated demographic information. This promotes the sharing of the findings and promoting unified support of suggested interventions made by the risk assessors following environmental investigation results.

Environmental Services

The CLPPP provides lead risk assessment services to detect hazardous sources of lead exposure in children's homes. This service is provided for children age six and younger who have a confirmed venous blood lead level of 15 µg/dL or greater and is offered at 5 µg/dL.

A risk assessment is conducted by a professional, trained and licensed by the DHSS Lead Licensing Program. The assessor consults with the child's family to determine areas of the home where the child may come into contact with lead. X-ray Fluorescence Analyzers (XRFs) are used to analyze painted surfaces and household objects. Dust, soil, and water samples are collected to determine if and where lead hazards exist. Upon completing the assessment and receiving the lab analysis, the risk assessor provides the property owner and/or occupant (if other than the owner) with recommendations for reducing lead hazards. The risk assessor revisits the home at an agreed-upon time to assure lead hazard reduction has been accomplished. The risk assessor collaborates with the child's parent or legal guardian, property owner, LPHA or MO HealthNet lead case manager, DHSS CLPPP staff, and the child's physician as indicated, as part of their role in case management of the elevated child. Risk assessment reports are also accessible to team members if a risk assessment was conducted on a child with a blood lead level of 5 µg/dL or greater.

Healthy Homes

Since the beginning of the "Is Your Home Healthy?" exhibit in 2007, the exhibit has been adapted for use at a variety of events throughout the state. The main exhibit focuses on the Healthy Indoor Environments unit in the Bureau of Environmental Epidemiology. The primary programs highlighted are the Childhood Lead Poisoning Prevention Program and the Indoor Air/Radon Program. Information is available on a variety of topics including lead poisoning prevention, radon and mold remediation, the fish consumption advisory, asbestos-containing vermiculite insulation, carbon monoxide poisoning prevention, heat and cold illness prevention, mercury handling and disposal, and other environmental health topics as appropriate for the event and audience. Coloring and activity books, magnets, and stickers are available to capture the interest of guardians and children. Employees from various DHSS programs work the exhibit and are available to answer questions about environmental health concerns from citizens. The exhibit also features hand washing information from the Bureau of Communicable Disease Control and Prevention along with tick and mosquito repellent information from the Vector Borne Disease Program.

Between July 1, 2016, and June 30, 2017, "Is Your Home Healthy?" was displayed at 34 different venues across the state and provided 12,000 handouts. These included the new Local Public Health Administrators training; St. Louis, Kansas City, and Jefferson City Home Builders Association Home Shows; Missouri School Nurse Conference; Missouri Environmental Educator Conference; and school and community health fairs.

The "Is Your Home Healthy?" exhibit is an ongoing collaborative effort between the Bureau of Environmental Epidemiology programs, the Bureau of Communicable Disease Control and Prevention, the Vector Borne Disease Program, and the local health departments. This outreach effort continues to help build partnerships with outside organizations such as Parents as Teachers, child advocates, school nurses, contractors, environmental health professionals, senior citizen groups, and parents. At the same time, it provides valuable information to and helps educate the citizens of Missouri about environmental hazards in their homes.

Agency for Toxic Substance and Disease Registry (ATSDR)/Environmental Protection Agency (EPA)/Missouri Department of Natural Resources (MDNR)

Lead mining, milling, and smelting have occurred throughout the lower half of Missouri. Missouri ranks as the top lead-producing state in the nation. Across the state, there are 60 counties that are potentially impacted by lead mining-related activities.

Historical lead mining, milling, and processing have resulted in innumerable tons and acres of waste products, such as tailings and chat. Over time, tailings and chat have migrated into the surrounding communities. The migration has been caused by wind or water erosion, as well as human activities, such as using the lead waste as fill material in yards, driveways, and sandboxes or using the chat for traction along roads in winter. Because of the lead mine waste and the resulting contamination into nearby communities, Missouri has many sites placed on the Environmental Protection Agency (EPA) National Priorities List (NPL) for remediation. In St. Francois County, six large mine tailings and chat piles from past mining and milling operations are located near residential areas. Other major lead mining sites that have been placed on the NPL due to residential contamination include Madison and Jefferson counties; sites in Newton, Jasper, and Iron counties; and four sites in Washington County. The active lead smelter in Herculaneum, Missouri, ceased operation on December 31, 2013. The smelter processed lead concentrate from active mining and milling operations in nearby counties into lead ingots for use in consumer products like batteries and computers. Lead contamination resulting from the smelter operations is also being addressed in the community of Herculaneum.

DHSS, along with other state, local and federal agencies (including ATSDR, EPA, and MDNR), is addressing these sites to protect public health. Multiple actions have been taken to reduce human exposure and prevent lead poisoning, especially to children less than six years old. Some of the actions taken by partnering agencies at the various sites to reduce exposure include monitoring of air, sampling of soil, water, and dust, stabilization of the tailings piles, yard soil removals, street cleanings, interior home cleaning, reduction in smelter air emissions, and special blood lead testing events. Additional activities conducted by DHSS include health studies, health consultations, public health assessments, and ongoing educational activities.

Brownfield Project

Vast areas of Missouri may have high levels of lead in soil and/or groundwater due to naturally occurring lead deposits and from past and present lead mining and production. Given the recent rapid expansion of urban sprawl, many previously undeveloped properties are now being looked at by developers for residential housing and other types of increased land use. Development of this nature on mining-impacted lands potentially exposes new populations to lead and other heavy metal contaminants.

Under a grant from ATSDR, DHSS acted to increase testing for lead in drinking water by working with the State Public Health Laboratory to add lead to its list of analytes included in the New Well Series for private drinking water supplies and by recommending actions that local public health agencies can take to increase testing. DHSS also developed health education materials to promote water testing for lead. To assist in responding to homeowner concerns for those identified with lead impacts to their drinking water system, a lead in drinking water fact sheet was developed that can be provided along with test results with recommendations for reducing exposure. These health education materials can be found at the following DHSS web site:

<http://health.mo.gov/living/environment/lead/publications.php#gov>.

DHSS Lead Licensing Program

The Lead Licensing Program is responsible for licensing individuals to conduct lead abatement, inspections, and risk assessments. Employees of this section may make unannounced site visits to check that all individuals have the proper current license and that lead abatement is being conducted correctly and safely. This is to ensure the safety of the residents who may not know the harmful effects of improper lead abatement work practices. Like CLPPP, the Lead Licensing Program plays an important role in keeping people healthy and safe from lead poisoning. All risk assessors that are a part of CLPPP are licensed and overseen by the Lead Licensing Program.

Missouri Department of Social Services (MDSS), MO HealthNet Division (MHD)

Poverty is one major risk factor for lead poisoning. DHSS and MHD have had a cooperative agreement in place since 1998. This agreement outlines the agencies' mutual objectives regarding childhood lead poisoning to: 1) assure that MO HealthNet eligible children are screened/tested according to the Statewide Lead Testing Plan; and 2) assure that medically necessary services are provided for MO HealthNet eligible children whether by a MO HealthNet enrolled provider or a MO HealthNet Managed Care health plan for the correction or amelioration of lead poisoning related conditions identified through a full or partial Early Periodic Screening Diagnosis and Treatment. During FY2017, MO HealthNet staff assessed the current MO HealthNet status of all Missouri children with confirmed blood lead levels 10 µg/dL or greater. MO HealthNet staff generates a health plan specific report of elevated health plan members that is forwarded to each health plan lead case manager for case management of the elevation. Lead case management activities for these elevated health plan children are documented by the health plan lead case managers, directly into the MOHSAIC Lead Case Management Application. This documentation helps to facilitate greater and timelier communication regarding follow-up of elevated children among the MO HealthNet Managed Care health plans, MHD, DHSS, and the LPHAs. DHSS staff representation on the Central Area Headstart Advisory Committee provides opportunities for education and outreach regarding lead poisoning awareness and prevention activities in the community.

Women, Infant, and Children (WIC) Program

High blood lead levels that affect intelligence, behavior, and the development of children less than six years of age disproportionately affect minority and poor children. The Special Supplemental Nutrition Program for WIC is an important partner in efforts to combat the health risks of lead poisoning. By identifying high-risk children through a screening process during WIC clinic visits, referring children to their primary care provider for testing, or making blood lead testing available on-site, the likelihood that more children will be blood lead tested is improved. This practice also helps to identify elevated children, as well as initiate timely and appropriate follow-up care.

Missouri Department of Economic Development (DED)

The Missouri Department of Economic Development FY 2013-2017 Consolidated Plan produced by DED includes Targeted and Universal Testing Area maps, blood lead testing data by county, and percentage of pre-1950 housing data for the state. The document also contains the Missouri Housing Development Commission's lead-based paint policies and procedures and the HOME Repair (HERO) Program's and HOME Rental Production Program's lead-based paint reference guide.

Missouri Local Public Health Agencies (LPHAs)

Many LPHAs offer blood lead testing within their counties. Some agencies offer free blood lead testing or referrals to providers that offer testing. Most of these agencies have a nurse that assists with case management for children who have elevated lead levels; however, this nurse works in collaboration with the child's primary care physician, parent or guardian, managed health care plan, if the child is enrolled, and environmental risk assessors. DHSS' CLPPP staff collaborates with LPHA staff on elevated lead cases to provide initial and ongoing technical assistance regarding lead case management activities, as well as environmental risk assessment. Lead poisoning education and outreach is often offered at the LPHA level at health fairs, through physician offices, childcare facilities, and upon request. LPHAs utilize lead poisoning prevention campaigns to assist in raising community awareness regarding lead poisoning and its health effects. LPHAs are often a primary contact for parents of children attending childcare facilities where proof of lead testing is required. This is typically a convenient access point for lead testing and opportunity for provision of educational lead information to families. The Childhood Lead Poisoning Prevention Program also provides these agencies with educational materials and technical assistance for other related issues such as the use of the MOHSAIC application, lead case management training, and current program and regulatory requirements. The support and ongoing efforts of the LPHAs regarding childhood lead poisoning and its prevention play a key role in the primary goal to eliminate childhood lead poisoning.

St. Louis City, St. Louis County, and Kansas City are Missouri's three largest metropolitan areas. According to 2017 surveillance data, these three areas combined contain 53 percent of Missouri's children with elevated blood lead levels (285 of 537). These three areas along with Jasper County, Greene County, and Jefferson County have lead poisoning prevention programs that are managed by the LPHAs. To decrease the prevalence of EBLs in these areas, DHSS collaborates with these LPHAs, who provide lead poisoning prevention educational activities, assure case management, and environmental risk assessments.

DHSS collaboration efforts include loaning department-owned XRFs to three LPHAs for lead-related work activities. Jefferson County and Jasper County each have lead poisoning prevention programs where the XRFs are utilized. Madison County has an ongoing project using the XRF to measure lead levels in soil. The department was able to loan an XRF to each of these counties, as they were not able to purchase their own XRFs for their programs. The loaning of the XRFs to these lead programs provides a fast, accurate alternative for those programs to identify lead hazards and promote the remediation of those hazards.

For more information on lead poisoning prevention contact:

Missouri Department of Health and Senior Services
Bureau of Environmental Epidemiology
930 Wildwood Drive
Jefferson City, MO 65109
Phone: (573) 751-6102 or (866) 628-9891

Or visit our website at:

<http://health.mo.gov/living/environment/lead/index.php>